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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,762	11/17/2003	Dennis J. Schloeman	10014406-3	3356
7590 11/02/2005			EXAMINER	
HEWLETT-PACKARD COMPANY			NGUYEN, LAM S	
Intellectual Property Administration			ART UNIT	
P. O. Box 272400			PAPER NUMBER	
Fort Collins, CO 80527-2400			2853	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/714,762	SCHLOEMAN ET AL.	
	Examiner	Art Unit	
	LAM S. NGUYEN	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 August 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8, 14 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-13, 15-19 and 21-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 January 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

*The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.*

1. Claim 27 recites the limitation "each fire pulse" on line 2 without sufficient antecedent basis for this limitation in the claim due to lacking of defining the comprising of a plurality of firing pulses.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

*(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.*

2. Claims 1-2, 9-10, 15-16, 21-22, 24, 26-27 are rejected under 35 U.S.C. 102(a) as being anticipated by Wade et al. (US 6290333).

**Referring to claim 1, 9, 15, 21, 24, 26:**

Wade et al. discloses a fluid ejection device comprising:

an internal power supply path configured to provide a substantially constant voltage (*FIG. 3, element 140*),

a plurality of nozzles, wherein each nozzle corresponds to a corresponding one of a plurality of firing resistors (*FIG. 3 and column 6, lines 35-39: Each firing resistor 44 has a corresponding nozzle*);

a plurality of zones, wherein each zone comprises a plurality of

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nozzles and corresponding firing resistors (*FIG. 2B and column 6, lines 46-55: Each ink ejection element group 90 forms a zone*); and

at least one multiplexer responsive to a select address to couple a first fire pulse to a first plurality of firing resistors in a first zone (*column 6, lines 40-45 and FIG. 2B: The first firing pulse is coupled to a plurality of the firing resistors in the first zone formed by the ink ejection group 1, for example*), so that a first plurality of selected firing resistors in the first zone are coupled to the first fire pulse (*column 8, lines 16-24*) (**Referring to claim 26**), or to couple multiple fire pulses to the firing resistors in the zones so that selected firing resistors in the same zone are coupled to a same fire pulse (*FIG. 2B: The multiple fire pulse 1-N, each is coupled to a corresponding zone so that only firing resistors in the same zone such as zone 1 (formed by ink ejection group 1), are coupled to a same firing pulse such as firing pulse 1, for example*) (**Referring to claims 1, 9, 15, 21-22, 24**), wherein the first fire pulse controls an initiation and a duration in which the first plurality of selected firing resistors in the first zone are coupled to the internal power supply path to thereby control fluid ejection from the nozzles in the first zone corresponding to the selected firing resistors (*column 8, lines 16-27 and FIG. 2B: The pulse-width modulate firing pulse 94*).

**Referring to claims 2, 10, 16:** wherein the select logic couples each fire pulse to a unique one or more zones for each value of the select address (*FIG. 2B: The multiple fire pulse 1-N, each is coupled to a corresponding unique zone*).

**Referring to claim 27:** wherein the at least one multiplexer couples each fire pulse including the first fire pulse to a unique one or more zones for each value of the select address

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(FIG. 2B: Each firing pulse 1-N is coupled to the associated ink ejection element group 1-N (element 90)).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

3. Claims 4, 6-7, 11-13, 17-19, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wade et al. (US 6290333) in view of Saul (EP 1080898 A2).

Wade et al. discloses the claimed invention as discussed above except further comprising feed slots, wherein each zone is defined to include only the nozzles in fluid communication with at least one feed slot, wherein each feed slot has at least one zone, and wherein the nozzles in fluid communication with the at least one feed slot are disposed on the fluid ejection device to be adjacent to the at least one feed slot on either a first side or a second side of the at least one feed slot, wherein each zone is defined to include only the nozzles positioned on the first side, or only the nozzles positioned on the second side, wherein either the first side or the second side has at least one zone, and wherein the plurality of resistors and plurality of corresponding nozzles of the at least one zone of the plurality of zones are arranged in a plurality of primitive groups, each of the resistors and corresponding nozzles being located in one of the primitive groups and the selected resistors in the first zone of the plurality of zones are each located in corresponding different primitive groups, and wherein the zones are organized on the fluid ejection device into rows and columns, wherein if a value of the select address is a first select address, the select

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logic couples each fire pulse to each row so that each firing resistor in each zone in the row is coupled to the same fire pulse, and wherein if the value of the select address is a second select address, the select logic couples each fire pulse to each column so that each firing resistor in each zone in the column is coupled to the same fire pulse (**Referring to claims 4, 11, 17**).

Saul discloses a thermal inkjet printhead including a plurality of printing elements (*FIG. 3*), each comprising a heating/firing resistor and a corresponding nozzle (*FIG. 3, elements 301, 309, and 303*), wherein the plurality of printing elements are organized in a plurality of zones (*FIG. 6A, elements 602, 604, 606, 608, 610, 612, 614-615, 616, 618, 620, 622*), each includes only the nozzles in fluid communication with at least one feed slot (*FIG. 6A, elements 670, 672, 674*), wherein each feed slot has at least one zone, and wherein the nozzles in fluid communication with the at least one feed slot are disposed on the fluid ejection device to be adjacent to the at least one feed slot on either a first side or a second side of the at least one feed slot, wherein each zone is defined to include only the nozzles positioned on the first side, or only the nozzles positioned on the second side, and wherein either the first side or the second side has at least one zone (*FIG. 6A: The zone 615 and 614 are each on either a first side or a second side of the feed slot 670, for example*), wherein the plurality of heating/firing resistors and corresponding nozzles of the plurality of zones are arranged in a plurality of primitives groups, each of the resistors and corresponding nozzles being located in one of the primitive groups and the selected resistors in the first zone of the plurality of zones are each located in corresponding different primitive groups (*Column 7, lines 20-28: Two primitives are formed in a region (zone). In FIG. 1B, in response to an address signal at A1, the resistors in primitives P1 and P2 are activated*), and wherein the zones are organized on the fluid ejection device into rows and

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columns (*FIG. 5A*), wherein if a value of the select address is a first select address, the select logic couples each fire pulse to each row so that each firing resistor in each zone in the row is coupled to the same fire pulse, and wherein if the value of the select address is a second select address, the select logic couples each fire pulse to each column so that each firing resistor in each zone in the column is coupled to the same fire pulse (*FIG. 4, 5A, 6B*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the printhead structure disclosed by Wade et al. to include the feed slots and to organize the plurality of printing elements into zones as defined by Saul. The motivation for doing so would have been to make the inkjet head more reliable as taught by Saul (*column 7, lines 8-10*).

4. Claims 3, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wade et al. (US 6290333) in view of Shiraishi et al. (US 6186611).

Wade et al. discloses the claimed invention as discussed above and also discloses wherein the fluid ejection device is coupled to an electronic controller for providing the select address and the fire pulses (*FIG. 2B*). However, Wade et al. is silent wherein the select logic includes one or more multiplexers.

Shiraishi et al. discloses an ink jet printer having a select logic unit responsive (*FIG. 1*) that generates and provides multiple fire pulses (*FIG. 1, signals SM1-4*) to a printhead (*FIG. 1, element 2*) having a plurality of firing elements (*FIG. 1, element 2*), wherein the select logic unit includes one or more multiplexers (*FIG. 1, element 11-14*) operable to output a particular fire pulse to a corresponding target.

Therefore, it would have been obvious for one having ordinary skill in the art at the time

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the invention was made to modify the select logic unit in Wade et al.'s printing apparatus to include one or more multiplexers as disclosed by Shiraishi et al. The motivation for doing so would have been to be able to output a firing pulse of a plurality of firing pulses to a desired target such as ejection elements in order to change the ink ejection quantity to achieve a high speed gradation printing as taught by Shiraishi et al. (*column 2, lines 40-44, lines 55-60*).

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wade et al. (US 6290333) in view of Saul (EP 1080898 A2), as applied to claim 4, and further in view of Shiraishi et al. (US 6186611).

Wade et al., as modified, discloses the claimed invention as discussed above and also discloses wherein the fluid ejection device is coupled to an electronic controller for providing the select address and the fire pulses (*FIG. 2B*). However, Wade et al. is silent wherein the select logic includes one or more multiplexers.

Shiraishi et al. discloses an ink jet printer having a select logic unit responsive (*FIG. 1*) that generates and provides multiple fire pulses (*FIG. 1, signals SM1-4*) to a printhead (*FIG. 1, element 2*) having a plurality of firing elements (*FIG. 1, element 2*), wherein the select logic unit includes one or more multiplexers (*FIG. 1, element 11-14*) operable to output a particular fire pulse to a corresponding target.

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the select logic unit in the printing apparatus as disclosed by Wade et al., as modified, to include one or more multiplexers as disclosed by Shiraishi et al. The motivation for doing so would have been to be able to output a firing pulse of a plurality of firing pulses to a desired target such as ejection elements in order to change the ink ejection quantity to



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achieve a high speed gradation printing as taught by Shiraishi et al. (*column 2, lines 40-44, lines 55-60*).

***Allowable Subject Matter***

Claims 8, 14, and 20 are allowed and reasons for allowance were indicated in the previous office action mailed on 11/16/2004.

***Response to Arguments***

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S. NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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HAI PHAM  
PRIMARY EXAMINER